Virginia's Best Genetics in Loblolly Pine

Virginia DOF Nurseries
Growing Tomorrow's Woods

Loblolly Pine Crop Highlights

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Why are Virginia Trees Your Best Choice?

Cooperative Efforts

The Virginia State Nurseries are proud to be a member of The Cooperative Tree Improvement Program at North Carolina State University. The mission of the Cooperative is to economically increase forest productivity through the genetic manipulation of loblolly pine populations. Enhanced productivity through breeding, selecting and deploying superior loblolly pine families is a major goal of the Cooperative.

- Due to the cooperative sharing of genetic material, all of the best families that are suitable for Virginia are in our program.
- Selections have continuously placed extra emphasis on properties desirable for solid wood products (straightness, crown characteristics).
- Some families from other provenances and cold hardiness zones either fail in Virginia or perform erratically.

Advantages of Our Genetically Improved Loblolly Pine

- Improved genetics for fast-growing, straight and disease-resistant seedlings.
- Increased growth and yield over unimproved seedlings.
- Increased profits from improved growth.
- Our seedlings go completely dormant for shipping, and fully dormant seedlings withstand shipment and planting significantly better than non-dormant seedlings.
- We top clip our seedlings, which controls the shoot/root ratio contributing to excellent survival rates.
- Pioneered pales weevil treatment.
- Limited supply due to scarcity of seed.

Benefits of Top Clipping Seedlings

Top clipping seedlings is a cultural practice that makes a big difference in seedling performance. This practice controls the shoot/root ratio, which is the single biggest reason for good survival. Our research in Virginia has shown repeatedly that seedlings with a shoot/root ratio of more than 2:1 will not survive as consistently well as seedlings with a shoot/root ratio of less than 2:1.

Top clipped seedlings perform more consistently.

Importance of Dormancy

Our seedlings go completely dormant. This is very important for storage, shipping and planting. Fully-dormant seedlings can be stored for two to three months without survival loss and can withstand shipment and planting much better than non-dormant seedlings.

Virginia is at the northern end of the loblolly growing range. Garland Gray Forestry Center participated in a cold hardiness and dormancy study as a member of the Auburn University Nursery Cooperative. As expected, this study showed that the more northern loblolly families are much more cold hardy. Our families are quicker to go dormant and slower to come out of dormancy. Southern families react much faster to a warm spell and tend to come out of dormancy sooner. Due to warmer weather, seedlings grown farther south frequently never go completely dormant.

Lifting seedlings while dormant improves survival.

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Pales Weevil Treatments

Pales weevil can have a devastating effect on seeding survival, ultimately causing high mortality in newly-planted pine stands. This insect feeds on the stems of pine seedlings, primarily in newly-cutover stands being replanted.

VDOF pioneered the use of permethrin in treating seedlings for pales weevil control. Studies were done to develop an application method that works. To successfully treat pine for pales weevil, the stem must be treated; simply applying over the top with a three-point hitch sprayer does not work since it does not reach the stem. VDOF's treatment method penetrates to the stem, treating the most vulnerable part of the seedling.

Virginia's Best Genetics

"Virginia's Best"

As the name implies, this is our best producing open pollinated tree within our seed orchard. The biggest difference when compared to our controlled mass pollination is that this tree is open pollinated. This results in offspring from several different pollen sources. However, these seedlings still could show up to a **62 percent growth gain**. Both the controlled mass pollination and Virginia's Best Elite will be offered in low quantities this season.

Controlled Mass Pollination

This seed lot comes from a relatively new technique of isolating female reproductive organs on high-quality trees and fertilizing them with pollen from a known source. Therefore, when seed collection occurs, we can be assured that we know the true parents of the offspring. This year, we have 10 different crosses, which produced about 32 pounds of loblolly seed. The ratings for this seed lot are estimated to be **55 percent growth gain** above unimproved seedlings.

Elite

This is a mix of seed from several different families but still from our best families. Ultimately, we have taken out the best producer, which is being sold as "Virginia's Best", and included all other Elite within this seed lot. The ratings for these seedlings averages out to around **45 percent growth gain**. This crop will be increased to about one and a half million seedlings this year from the half million we sold in 2010.

Premium

The Premium seed lot comes from a mixture of a larger group of trees, of course excluding the next-best genetics. Our Premium seedlings will be our largest offering of the crop, and we project to have around 14 million available for Virginia landowners this year. The potential for our Premium seedlings is about a **35 percent growth gain** above unimproved stock.

Third Cycle Orchard Mix

This is a more traditional name that describes the origin of our seedlings. At this point, we are within our second generation of improved seedlings. Through this process, we have been able to differentiate among our best genetics. The best producers obviously fall within our Elite and Premium mix and others fall within this category. The third cycle means that we have further improved our second generation seed orchard by again collecting seed from trees that have proven to be better performers. These seedlings are expected to show around a **30 percent growth gain**.

Second Generation Orchard Mix

Over the past couple of years, this has been sold as second generation seedlings. However, these seedlings are merely what has been left over after pulling out our higher quality producers. While these seedlings are not for everyone, they are still better than what we had about five years ago. Our research for this seed indicates a **25 percent growth gain** over unimproved seedlings.

Seedbeds at Garland Gray Forestry Center

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